norma

Improved Ballistics

of

CENTER FIRE RIFLE PISTOL AND REVOLVER CARTRIDGES

1956

THE 1956 IMPROVED norma BALLISTICS

Rifle cartridges

With all American cartridge types NORMA velocities equal American standards.

Loads shown refer to NORMA tubular powders type 101, 103 and 104, and give the data shown in tables when fired in barrels of standard dimensions. NORMA powders have been especially developed for NORMA ammunition in close cooperation with one of the most modern powder factories in Europe. They are especially selected for the case capacity, caliber and bullet weight for which they are being used, and give high velocities with moderate gas pressures and a minimum of barrel erosion. This research work was finished during 1955, and we believe these powders represent the most advanced developments in match- and hunting ammunition propellants today. All pressures shown in tables are ten-shot averages, measured with standard European pressure gages. NORMA Boxer type, non-corrosive, non-mercuric primers are used in NORMA ammunition. Cartridge length is given in tables to insure correct seating depth of bullets during handloading with NORMA components. NORMA cartridge cases can be loaded and reloaded with NORMA or other bullets and commercial American powders and primers. *Loads given in tables apply to NORMA powders only.* When handloading with other powders, suitable loading data must be used.

Also note that high-velocity loads may give excessive pressure if case capacity is reduced by seating bullet too far down into the case. On the other hand we do not recommend that bullets be seated so far out in the case that they bear on rifling lands before firing. A "free boring" of 2-4 mm is recommended for normal hunting cartridges.

norma 1956 BALLISTICS OF CENTER FIRE PISTOL AND REVOLVER CARTRIDGES

CARTRIDGE	BULLET Wt. grs.	BULLET Style	MUZZLE VELOCITY Feet per second	MUZZLE ENERGY Foot pounds	BARREL Length
.32 ACP	77	FJ	900	139	4
.30 Luger	93	FJ	1230	312	4 ¾
* 9 mm 1. Brown	110	FJ	1130	312	5
9 mm Luger	116	FJ	1165	350	4 ¾
* 9 mm Luger High Speed	116	FJ	1330	456	9
* 7,5 mm Nagant	103	Lead round nose	790	143	4 ½
.38 Special	148	Lead sharp shoulder	770	195	6

* Berdan primed.

All norma pistol and revolver cartridges have non-corrosive, non-mercuric primers. .32 ACP, .30 Luger, 9 mm Luger and .38 Special cases are marked "Re," meaning "Reloadable with standard American Boxer-type primers." The 9 mm Luger High Speed load is intended for submachine-guns, and we do not recommend its use in ordinary automatic pistols because of its higher breech pressure. While rifle and revolver cartridges should be kept dry during firing, a very slight coating of lubricating oil might improve the functioning of automatic pistol cartridges.

norma

IMPROVED 1956 BALLISTICS

CENTER FIRE RIFLE CARTRIGDES WITH NON-CORROSIVE, NON-MERCURIC PRIMING

CARTRIDGE	BULLET		POWDER		CTG	PRESSURE	VELOCITY, FEET PER SECOND				ENERGY, FOOT POUNDS				MID-RANGE TRAJECTORY			NOTE
	Wt. grs.	Style	Type	Load	Length	P.S.I.	Muzzle	100 yds	200 yds	300 yds	Muzzle	100 yds	200 yds	300 yds	100 yds	200 yds	300 yds	
.220 Swift	48	spp	103	40.9	2.68	52920	4110	3610	3130	2680	1795	1385	1040	765	0	1.0	3.2	
.250 Savage	87	spp	101	34.2	2.44	45570	3030	2680	2360	2060	1775	1390	1070	815	.1	2.0	5.9	
	100	spp	101	31.6	2.52	41450	2820	2500	2200	1920	1765	1385	1070	820	.2	2.4	7.2	
.257 Rob.	100	spp	104	41.2	2.76	38220	2900	2580	2270	1990	1865	1470	1140	875	.2	2.2	6.4	
	120	spp	104	38.3	2.79	39800	2630	2390	2160	1950	1835	1515	1240	1010	.3	2.7	7.3	
6.5 Jap	77	spp	101	32.4	2.44	25230	2720	2350	2010	1700	1270	944	691	494	.2	2.1	6.0	
	93	fjp	101	33.2	2.52	29840	2690	2280	1910	1590	1485	1065	750	520	.3	3.0	8.9	
	139	fjbt	101	31.6	2.84	32050	2430	2280	2130	1990	1815	1600	1405	1225	.4	2.9	7.7	
	156	spr	103	27.5	2.91	31610	2070	1870	1690	1530	1475	1210	990	810	.7	4.6	12.0	
	156	fjr	103	27.5	2.91	31610	2070	1870	1690	1530	1475	1210	990	810	.7	4.6	12.0	
6.5 × 54	77	spp	101	39.4	2.58	37600	3120	2730	2370	2040	1660	1275	960	710	.1	1.9	5.8	
	93	fjp	101	39.4	2.66	41160	3050	2610	2210	1850	1910	1400	1000	700	.1	2.2	6.5	
	139	fjbt	101	35.5	3.03	44100	2580	2420	2270	2120	2040	1805	1590	1390	.3	2.5	6.8	
	156	spr	101	34.7	3.07	44100	2460	2240	2030	1840	2095	1735	1430	1170	.4	3.1	8.3	
	156	fjr	101	34.7	3.07	44100	2460	2240	2030	1840	2095	1735	1430	1170	.4	3.1	8.3	
6.5 × 55	77	spp	101	42.9	2.62	33210	3120	2730	2370	2040	1660	1275	960	710	.1	1.9	5.8	
	93	fjp	103	44.8	2.70	41160	3150	2710	2290	1920	2035	1500	1080	760	.1	2.0	6.1	
	139	fjbt	104	42.9	3.07	46310	2790	2630	2470	2320	2395	2130	1880	1650	.2	2.1	5.6	
	156	spr	104	42.4	3.15	44390	2490	2270	2060	1870	2150	1785	1470	1205	.4	3.0	8.0	
	156	fjr	104	42.4	3.15	44390	2490	2270	2060	1870	2150	1785	1470	1205	.4	3.0	8.0	
.270 Win.	130	spbt	104	56.0	3.19	47330	3140	2880	2640	2400	2835	2390	2000	1661	.07	1.7	4.8	
	130	hpbt	104	56.0	3.19	47330	3140	2860	2590	2340	2835	2350	1935	1571	.07	1.7	4.9	
	130	fjbt	104	56.0	3.23	47330	3140	2940	2750	2570	2835	2490	2180	1895	.07	1.6	4.4	
	150	spbt	104	51.4	3.27	45130	2800	2570	2350	2140	2605	2190	1825	1515	.2	2.2	6.1	
	150	fjbt	104	51.4	3.33	45130	2800	2640	2490	2340	2605	2315	2055	1811	.2	2.1	5.6	
7 × 57	150	spbt	101	40.1	3.01	47480	2760	2540	2330	2130	2520	2140	1805	1510	.2	2.3	6.3	
	154	fjbt	101	40.1	3.07	47480	2720	2570	2420	2280	2535	2260	2005	1775	.2	2.2	5.9	
.30-06	130	spbt	101	55.6	3.11	47040	3280	2950	2640	2340	3095	2505	1995	1570	.04	1.6	4.7	
	130	fjbt	101	55.6	3.11	47040	3280	2950	2640	2340	3095	2505	1995	1570	.04	1.6	4.7	
	150	spbt	103	54.0	3.19	44540	2970	2680	2400	2140	2930	2385	1915	1520	.1	2.0	5.7	
	150	fjbt	103	54.0	3.19	44540	2970	2680	2400	2140	2930	2385	1915	1520	.1	2.0	5.7	
	180	spbt	103	50.2	3.27	44540	2700	2490	2290	2100	2895	2460	2080	1745	.2	2.4	6.5	
	180	hpbt	103	50.2	3.27	44540	2700	2490	2290	2100	2895	2460	2080	1745	.2	2.4	6.5	
	180	fjbt	103	50.2	3.33	44540	2700	2530	2370	2210	2895	2540	2220	1930	.2	2.3	6.1	
	220	spr	103	47.8	3.31	43660	2410	2200	2000	1810	2825	2345	1935	1590	.4	3.2	8.6	
	220	fjr	103	47.8	3.31	43660	2410	2200	2000	1810	2825	2345	1935	1590	.4	3.2	8.6	
.300 H & H	180	spbt	104	67.9	3.60	47630	2920	2700	2490	2280	3385	2900	2465	2070	.1	2.0	5.4	
	180	hpbt	104	67.9	3.60	47630	2920	2700	2490	2280	3385	2900	2465	2070	.1	2.0	5.4	
	180	fjbt	104	67.9	3.60	47630	2920	2740	2570	2410	3385	2985	2625	2295	.1	1.8	5.2	
	220	spr	104	62.8	3.60	48800	2630	2400	2190	1990	3350	2800	2325	1915	.3	2.6	7.1	
	220	fjr	104	62.8	3.60	48800	2630	2400	2190	1990	3350	2800	2325	1915	.3	2.6	7.1	
.303 Brit.	150	fjp	101	40.9	3.09	31610	2560	2320	2100	1890	2175	1790	1465	1190	.3	2.8	7.7	
	180	spr	101	39.7	2.93	41160	2410	2070	1780	1520	2300	1710	1255	920	.5	3.7	10.5	
	215	spr	101	37.5	3.07	41900	2180	1920	1690	1480	2280	1765	1360	1055	.6	4.3	11.9	
7.7 Jap	150	fjp	101	47.4	3.17	36160	2790	2540	2310	2090	2580	2145	1765	1445	.2	2.3	6.3	
	180	spr	101	44.4	3.01	37250	2490	2160	1850	1580	2470	1845	1360	995	.4	3.4	9.6	
	215	spr	101	40.9	3.13	37560	2260	2000	1750	1540	2460	1910	1470	1130	.5	4.0	10.9	
8 × 57 J	159	spr	101	45.4	2.85	39840	2720	2130	1640	1270	2615	1605	945	565	.4	3.6	11.6	
	159	fjr	101	45.4	2.85	39840	2720	2130	1640	1270	2615	1605	945	565	.4	3.6	11.6	
	196	spr	101	43.2	2.99	45720	2530	2150	1820	1530	2775	2015	1440	1020	.4	3.4	9.9	
	196	fjr	101	43.2	2.99	45720	2530	2150	1820	1530	2775	2015	1440	1020	.4	3.4	9.9	
8 × 57 JR	159	spr	101	43.0	2.85	37190	2590	2020	1550	1210	2370	1440	845	510	.4	4.0	13.0	
	159	fjr	101	43.0	2.85	37190	2590	2020	1550	1210	2370	1440	845	510	.4	4.0	13.0	
	196	spr	101	40.3	2.97	37340	2360	2010	1690	1430	2425	1745	1240	885	.5	4.0	11.5	
	196	fjr	101	40.3	2.97	37340	2360	2010	1690	1430	2425	1745	1240	885	.5	4.0	11.5	
8 × 57 JS	159*	spbtr	101	46.3	2.85	44600	2720	2360	2030	1730	2615	1965	1455	1060	.3	2.8	7.9	
	196*	spbtr	101	44.8	2.99	47040	2530	2150	1820	1530	2775	2015	1440	1020	.4	3.4	9.9	
	196*	fjbtr	101	44.8	2.99	47040	2530	2150	1820	1530	2775	2015	1440	1020	.4	3.4	9.9	
	198*	hpbt	101	45.2	3.11	47630	2630	2410	2210	2020	3020	2555	2145	1790	.3	2.6	7.0	
	198*	fjbt	101	45.2	3.15	47630	2630	2460	2290	2140	3020	2640	2305	2005	.2	2.5	6.6	
8 × 57 JRS	159*	spbtr	101	43.2	2.85	37900	2590	2240	1920	1640	2370	1770	1300	945	.4	3.1	8.9	
	196*	spbtr	101	40.0	2.97	38960	2400	2030	1720	1450	2495	1800	1280	910	.5	3.8	11.1	
	196*	fjbtr	101	40.0	2.97	38960	2400	2030	1720	1450	2495	1800	1280	910	.5	3.8	11.1	
	198*	hpbt	101	41.2	3.11	38660	2460	2260	2060	1880	2655	2230	1865	1555	.4	3.0	8.0	
	198*	fjbt	101	41.2	3.15	38660	2460	2300	2140	1990	2655	2315	2010	1740	.4	2.9	7.6	
8 × 60	159	spr	101	49.7	2.97	46310	2820	2220	1710	1320	2805	1735	1030	610	.3	3.3	10.7	
	159	fjr	101	49.7	2.97	46310	2820	2220	1710	1320	2805	1735	1030	610	.3	3.3	10.7	
	196	spr	101	45.5	3.11	47040	2560	2180	1850	1560	2845	2070	1480	1050	.4	3.3	9.6	
	196	fjr	101	45.5	3.11	47040	2560	2180	1850	1560	2845	2070	1480	1050	.4	3.3	9.6	
8 × 60 S	159*	spbtr	101	49.4	2.97	47600	2820	2450	2110	1810	2805	2125	1575	1150	.2	2.5	7.3	
	196*	spbtr	101	46.0	3.11	47920	2590	2210	1870	1580	2920	2130	1525	1080	.4	3.2	9.3	
	196*	fjbtr	101	46.0	3.11	47920	2590	2210	1870	1580	2920	2130	1525	1080	.4	3.2	9.3	
	198*	hpbt	101	47.2	3.23	48950	2690	2480	2270	2080	3170	2690	2260	1890	.3	2.4	6.6	
	198*	fjbt	101	47.2	3.27	48950	2690	2520	2360	2200	3170	2780	2430	2115	.2	2.3	6.2	
8 × 54	159*	spbtr	101	41.4	2.73	36000	2560	2210	1890	1620	2310	1720	1265	920	.4	3.2	9.2	
	196*	spbtr	101	39.5	2.87	35570	2300	1950	1640	1390	2295	1650	1170	835	.6	4.2	9.9	
	196*	fjbtr	101	39.5	2.87	35570	2300	1950	1640	1390	2295	1650	1170	835	.6	4.2	9.9	
	198*	hpbt	101	40.1	2.99	36160	2360	2160	1980	1800	2445	2050	1710	1420	.4	3.3	8.8	
	198*	fjbt	101	40.1	3.07	36160	2360	2200	2050	1910	2445	2130	1845	1595	.4	3.2	8.3	
8 × 58 RD	196*	spbtr	103	43.7	3.03	29110	2230	1890	1600	1350	2165	1550	1105	785	.6	4.5	12.1	
	196*	fjbtr	103	43.7	3.03	29110	2230	1890	1600	1350	2165	1550	1105	785	.6	4.5	12.1	
	198*	hpbt	103	45.2	3.15	28670	2300	2100	1920	1750	2310	1935	1615	1340	.5	3.6	9.4	
	198*	fjbt	103	45.2	3.25	28670	2300	2140	1990	1850	2310	2010	1740	1505	.5	3.4	8.8	
9.3 × 57	232	hp	101	45.2	3.01	36020	2330	2010	1720	1480	2785	2075	1525	1125	.6	4.0	11.2	
	232	fjp	101	45.2	3.05	36020	2330	2070	1840	1630	2785	2205	1735	1360	.5	3.7	10.0	
	286	spr	101	42.1	3.19	35430	2070	1820	1600	1400	2705	2090	1615	1250	.8	4.9	13.3	
	286	fjr	101	42.1	3.19	35430	2070	1820	1600	1400	2705	2090	1615	1250	.8	4.9	13.3	
9.3 × 62	232	hp	101	56.8	3.19	46890	2630	2280	1970	1690	3535	2670	1985	1455	.3	3.0	8.5	
	232	fjp	101	56.8	3.23	46890	2630	2350	2090	1860	3535	2835	2245	1765	.3	2.8	7.6	
	286	spr	101	52.8	3.23	47630	2360	2090	1840	1610	3530	2760	2135	1645	.5	3.6	10.0	
	286	fjr	101	52.8	3.23	47630	2360	2090	1840	1610	3530	2760	2135	1645	.5	3.6	10.0	
9.3 × 72 R	200	spf	101	47.5	3.39	24840	2230	1800	1440	1180	2215	1435	920	615	.7	4.9	15.4	
9.3 × 74 R	232	hp	101	58.5	3.64	41160	2630	2280	1970	1690	3535	2670	1985	1455	.3	3.0	8.5	
	232	fjp	101	58.5	3.68	41160	2630	2350	2090	1860	3535	2835	2245	1765	.3	2.8	7.6	
	286	spr	103	56.2	3.68	41900	2360	2090	1840	1610	3530	2760	2135	1645	.5	3.6	10.0	
	286	fjr	103	56.2	3.68	41900	2360	2090	1840	1610	3530	2760	2135	1645	.5	3.6	10.0	

* Bullet diameter .323, only for "S-bore" barrels.

All data given in tables above are 10-shot averages of NORMA factory-loaded cartridges, fired in 23-inch barrels. Trajectory is given in inches in relation to line of sights, with front sight top .83 inches above center line of barrel.

NORMA AMMUNITION IS MADE BY NORMA PROJEKTILFABRIK, ÅMOTFORS, SWEDEN

HOW TO CHECK FREE-BORING OF YOUR RIFLE:

With one cartridge, preferably dummy cartridge, of correct length, one loose bullet of same type as in the cartridge, two pencils and a cleaning rod of about barrel length you are all set for this interesting experiment. We especially recommend that handloaders check their free-boring before any experiments with bullet seating depths are started.

Insert the cartridge in chamber and close breech, *SAFETY ON*, if you have no possibility of loading a dummy cartridge. Push cleaning rod into barrel from muzzle until it rests against the bullet nose. With one pencil scribe a mark on the rod even with the muzzle. Then place the loose bullet in the chamber instead of the cartridge, pushing it into the barrel with the second pencil as far as it will go. Holding bullet firmly in this place, again push cleaning rod down until it rests on bullet nose, and scribe another mark on it even with the muzzle. The distance between the two marks on the rod will be equal to the distance of free travel of bullet with the cartridge length tested.

Always remember

You don't kill your game at muzzle velocity, it's your *remaining velocity* that counts. NORMA bullets are designed to give maximum velocity and striking power also at the longer ranges.

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by

NORMA PROJEKTILFABRIK

ÅMOTFORS - SWEDEN

NEVER FORGET

to treat every gun with the respect due a loaded gun, and always be sure of your target before you pull the trigger.

Printed in Sweden

Esselte Reklam AB/Tryckeri AB Epege

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